
We will get started promptly at 2:00PM ET (1:00PM CT; 12:00PM MT; 11:00AM PT)
All phone lines have been muted
Before We Get Started…

Welcome to Today’s Expert Webinar for the 2019 MQii Learning Collaborative:
“The RDN/Oncology Patient Relationship: How Nutrition Interventions Work”

We will get started promptly at 2:00PM ET (1:00PM CT; 12:00PM MT; 11:00AM PT)

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## Today’s Agenda

<table>
<thead>
<tr>
<th>Agenda Item</th>
<th>Presenter</th>
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<tbody>
<tr>
<td>Welcome and introduction to the “The RDN/Oncology Patient Relationship: How Nutrition Interventions Work” webinar</td>
<td>Kelsey Jones</td>
</tr>
<tr>
<td>Engaging the Patient and Caregiver: Communicating the Importance of Nutrition in Oncology Care</td>
<td>Suzanne Dixon, MPH, MS, RDN</td>
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<tr>
<td>Case Study of a Malnutrition Screening at an MQii Learning Collaborative Site in Oncology Care at Ohio State University Medical Center (OSUWMC)</td>
<td>Natalie Stephens, RDN, LD, FAND</td>
</tr>
<tr>
<td>Questions – 15 mins</td>
<td></td>
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</table>
• Importance of nutrition care in cancer care diagnoses
• Examples of different types of weight loss as it relates to cancer care
• Focus on nutrition & exercise in the cancer care continuum
Why Is Nutrition Care Important?

• Cancer can profoundly affect nutrition status and affect nutrition-related, co-morbid conditions

• Cancer affects an astounding number of people

• Few people have access to nutrition care before, during, or after a cancer diagnosis

• Poor nutrition status is strongly predictive of poor outcomes.

• What kind of care do you want to provide? Raise your hand
Figure 1. Estimated Numbers of US Cancer Survivors

As of January 1, 2016

**Male**
- Prostate: 3,306,760
- Colon & rectum: 724,690
- Melanoma: 614,460
- Urinary bladder: 574,250
- Non-Hodgkin lymphoma: 361,480
- Kidney & renal pelvis: 305,340
- Testis: 266,550
- Lung & bronchus: 238,300
- Leukemia: 230,920
- Oral cavity & pharynx: 229,880
- **Total survivors**: 7,377,100

**Female**
- Breast: 3,560,570
- Uterine corpus: 757,190
- Colon & rectum: 727,350
- Thyroid: 630,660
- Melanoma: 612,790
- Non-Hodgkin lymphoma: 324,890
- Lung & bronchus: 288,210
- Uterine cervix: 282,780
- Ovary: 235,200
- Kidney & renal pelvis: 204,040
- **Total survivors**: 8,156,120

As of January 1, 2026

**Male**
- Prostate: 4,521,910
- Colon & rectum: 910,190
- Melanoma: 848,020
- Urinary bladder: 754,280
- Non-Hodgkin lymphoma: 488,780
- Kidney: 429,010
- Testis: 335,790
- Leukemia: 318,430
- Lung & bronchus: 303,380
- **Total survivors**: 9,983,900

**Female**
- Breast: 4,571,210
- Uterine corpus: 942,670
- Colon & rectum: 885,940
- Thyroid: 885,590
- Melanoma: 811,490
- Non-Hodgkin lymphoma: 436,370
- Lung & bronchus: 369,990
- Uterine cervix: 286,300
- Kidney & renal pelvis: 284,380
- Ovary: 280,940
- **Total survivors**: 10,305,870

NOTE: Beginning with the 2016-2017 edition, estimates for specific cancer types now take into account the potential for a history of more than one cancer type. Estimates should not be compared to those from previous years. See Sources of Statistics, page 34, for more information.

**Source:** Surveillance Research Program, Division of Cancer Control and Population Sciences, National Cancer Institute.

American Cancer Society, Surveillance and Health Services Research, 2016

What is Malnutrition?

An acute, subacute or chronic state of nutrition, in which a combination of varying degrees of overnutrition or undernutrition with or without inflammatory activity have led to a change in body composition and diminished function.

A state of nutrition in which a deficiency, excess, or imbalance of energy, protein, and other nutrients causes measurable adverse effects on body function and clinical outcome.

Not All Weight Loss Is Good Weight Loss

Unintentional vs. Intentional Weight Loss

**Intentional Weight Loss**
- Short term mobilization of fat and lean body tissues
- Rapid upregulation of fatty acid lipases
- Rapid change from using fat & lean tissues for energy to utilizing predominantly fat
- Preservation of lean tissue
- Upregulation of hunger hormones

**Unintentional Weight Loss**
- Short- and long-term mobilization of fat and lean body tissues, driven by inflammatory processes
- Failure to upregulate fatty acid lipases
- Inappropriate and continued mobilization of lean tissue
- Failure to preserve lean tissue
- Failure to upregulate hunger hormones
Failure to Adapt to Calorie Deficit Is Profound

- Detailed Metabolic/Functional Study of Head and Neck Cancer Patients (n = 17), Mean age = 59 yrs.
- Group included underweight, normal weight, overweight subjects
- Measures of REE, functional status, physical performance, body composition (DEXA), CRP, cytokines and 24-hour food recalls

RESULTS

- Weight loss began 1 week after chemo-radiation
- Average total loss of 6.8 kg (14.9 lbs; p<0.0001)
- Lean body mass accounted for 72% of weight lost

Not All Weight Loss Is Good Weight Loss!

Skeletal Muscle Depletion is a Powerful Prognostic Factor

Two prognostic models of survival in lung & GI cancer patients (n=1,473) (BMI distribution: 17% obese, 35% overweight, 36% normal weight, and 12% underweight)

- Conventional covariates: tumor type, stage, age, performance
- Nutrition covariates: BMI, weight loss, muscle index/attenuation

Immunotherapy & Obesity

REMEMBER: Not all weight loss is good weight loss.

Evidence Analysis Library: 2007 – 2013 Oncology Nutrition Update

6 original questions, 95 articles, 16 conclusion statements and 15 recommendations.

- **Grade I: Good** – the evidence consists of results from studies of strong design for answering the question addressed.
- **Grade II: Fair** – the evidence consists of results from studies of strong design
- **Grade III: Limited numbers of studies**
- **Grade IV: Expert opinion only**
- **Grade V: Not assignable**

**EAL 2007**
- Grade 1: 17%
- Grade 2: 9%
- Grade 3: 2%
- Grade 5: 2%
- Conclusion Statement Grades 2007 vs 2013: 72%

**EAL 2013**
- Grade 1: 6%
- Grade 2: 25%
- Grade 3: 6%
- Grade 5: 69%

**Conclusion Statement Grades 2007 vs 2013:**
- EAL 2007: 72%
- EAL 2013: 69%
Poor nutrition status is associated with decreased tolerance to radiation treatment in adult oncology patients.

Poor nutrition status is associated with decreased tolerance to chemotherapy treatment in adult oncology patients.

Poor nutrition status is associated with increased length of hospital stay (LOS) in adult oncology patients.

Poor nutrition status is associated with lower quality of life (QoL) in adult oncology patients.

Poor nutrition status is associated with mortality in adult oncology patients.

Why is Malnutrition So Harmful?

What is Lean Body Mass (LBM)?

- Organs
- Muscle
  - Skeletal Muscle: attached to bones and moves the skeleton
  - Smooth Muscle: located in the walls of hollow internal structures
  - Cardiac Muscle: forms the heart
- Bone
- Red and white blood cells, platelets, plasma and serum proteins, connective tissue...

LBM encompasses everything but fat

What Drives Malnutrition & Loss of LBM?

• Decreased protein synthesis
  – Aging
  – **Bed rest/sedentary behavior ("sitting disease")**
  – Chronic disease
  – Acute disease
  – Failure to meet increased protein needs with aging

• Increased protein breakdown
  – Illness and injury
  – Increased oxidation
  – Aging
  – Surgery, medications, medical interventions

Additional Protein Synthesis Challenges Contribute to Imbalance

- Muscle protein synthesis rates decrease with age; lower in older than in younger adults
- Reduced by 30% with 10 days of inactivity
- Ability of muscle to regenerate following injury or overload decreases with age
- Muscle composition can change, affecting function and mobility

Muscle Lost Is Difficult to Regain

Why Are So Many at Risk of Loss of LBM?

- Sedentary
- Elderly
- Bedrest
- Disability
- Chronic Obstructive Pulmonary Disease (COPD)
- Surgery, Sepsis, Trauma
- Chronic Kidney Disease
- Cancer and HIV/AIDS
Beyond Simple Obesity: You Can Be “Overfat” and Undernourished

**Sarcopenia** in cancer patients, regardless of BMI is associated with:

- Poor functional status
- Shorter time to tumor progression
- Shorter survival
- Higher incidence of dose-limiting toxicity
- And may alter metabolism of cytotoxic agents

Righting the Ship: Focus on Nutrition & Exercise
### Optimal Situation – RDNs Available Throughout the Cancer Continuum

<table>
<thead>
<tr>
<th>Pre-treatment</th>
<th>Treatment</th>
<th>Post-treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Screen for malnutrition</td>
<td>• Monitor changes in nutritional status as the treatment course progresses, modify nutrition plan as needed</td>
<td>• Prevent weight gain</td>
</tr>
<tr>
<td>• Determine baseline nutritional status, replete nutrient deficiencies as needed</td>
<td>• Identify appropriate foods (e.g. taste, texture, temperature) to optimize dietary intake as treatment-related side effects develop</td>
<td>• nutrition-related late effects</td>
</tr>
<tr>
<td>• Discuss potential treatment related side-effects, and nutritional strategies for minimizing the side effects</td>
<td>• Review safe food handling procedures during neutropenia</td>
<td>• chronic diseases</td>
</tr>
<tr>
<td>• Review food safety guidelines</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Protein, Protein, Protein

40% of people age 70 or older consume less than 100% of RDA for protein

RDA = 0.8 g/kg/day

Common Protein Guidelines
- Prevent sarcopenia: 1 to 1.5
- Elderly: 1.2 to 1.5
- Wound healing: 1.25 to 1.5
- Trauma/surgery 1.5 to 2
- Chronic illness 1.5 to 2
What is the Solution?

• **Resistance exercise**, preferably with a trained professional

• **PT and Rehab**, coupled with nutritional support

• **High quality protein** (with essential amino acids) stimulates muscle protein synthesis

• **Increased protein** requirements for older people above the current adult RDA

• **Equal distribution** of protein at each meal
Key Nutritional Goals

For Cancer

Energy

• 25 to 35 calories per kilogram bodyweight per day
  – 11.5 to 16 calories per pound bodyweight per day
  – Sources: Healthy fats (olive oil, nuts & nut butters, avocados),
    starchy vegetables (Purple and white potatoes, orange sweet
    potatoes, yellow yams, orange and yellow squash), fresh or
    frozen fruit

Protein

• 1.5 g protein per kilogram bodyweight per day
  – 0.7 g protein per pound bodyweight per day
  – Sources: Chicken; Fish; Lean beef and pork; Greek
    yogurt; Beans, lentils and peas; Soy foods; Eggs; Nuts; Cheese;
    oral, liquid nutritional supplements
Protein Distribution Matters

**Typical** Daily Protein Distribution
- Breakfast: 10 g
- Lunch: 20 g
- Dinner 60 g

**Ideal** Daily Protein Distribution
- Breakfast: 30 g
- Lunch: 30 g
- Dinner 30 g

STUDY: EVEN vs. SKEW protein intake. n = 8 adult men & women

- 24-hour muscle protein synthesis 25% higher in EVEN vs. SKEW groups.
- Maintained after 7 days habituation to the diet

CONCLUSION: The consumption of a moderate amount of protein at each meal stimulated 24-h muscle protein synthesis more effectively than skewing protein intake toward the evening meal.

Take Home message

- Patient must understand connection between unintentional weight loss and poor outcomes
- Lean body mass and muscle are vital for life and recovery
- Several mechanisms may overlap to accelerate loss – aging, bed rest, medical conditions, and inflammation
- Many are at risk and you may not realize it
- Loss of lean body mass reduces chance of recovery
- Don’t assume Normal BMI = Normal LBM
- Identify loss of lean body mass (and poor dietary intake)
- Intervene early and couple nutrition intervention with treatment, rehab and PT interventions
• Malnutrition and cancer care: high-level statistics and a partnership strategy

• Highlight a national quality improvement project in implementation and validation of a malnutrition screening tool in routine oncology cancer care

Natalie Stephens, RDN, LD, FAND
Lead Dietitian at the Ohio State University Medical Center
Assistant Director, Nutrition Services
Malnutrition & Cancer

- 30% to 80% of cancer patients malnourished at some point during cancer care

- > 50% exhibit nutritional impairments at the first visit

Malnutrition & Outcomes

- Involuntary weight loss of 5% is associated with decreased survival
- Increased
  - Morbidity and mortality
  - Treatment interruptions
  - Readmission rates
  - Side effects
  - Risk of cancer recurrence
- Decreased
  - Tolerance to chemo and radiation
  - Quality of Life
  - Functional performance

Organizations who advocate for formalized nutrition screening and assessment, nutrition care plans, and early medical nutrition therapy
Clinical Care Standards

- **Nutrition Standards**
  - >90% oncology care in outpatient centers
  - Joint Commission standards:
    - Inpatient within 24 hours admittance
    - Outpatient when warranted (ambiguous)

- **CoC**: Am College of Surgeons’ Commission on Cancer
- **ACCC**: Association of Community Cancer Centers
- **NCCN**: National Comprehensive Cancer Network
  - > 60 oncology practice guidelines
  - > 10 million downloads in 2018
  - Insurance coverage and quality evals
National Malnutrition Screening Project

- QI project to evaluate implementation and utilization of a validated screening tool in routine oncology cancer care
- MST (Malnutrition Screening Tool) implemented in EMR of 3 outpatient cancer centers

Alice Shapiro & Sarah Johnson
Jeannine Mills & Elise Cushman
Colleen Spees & Natalie Stephens
Validated Malnutrition Screening Tools

Malnutrition Screening Tool (MST)

**STEP 1: Screen with the MST**

<table>
<thead>
<tr>
<th>Question</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you recently lost weight without trying?</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>Unsure</td>
<td>2</td>
</tr>
<tr>
<td>If yes, how much weight have you lost?</td>
<td></td>
</tr>
<tr>
<td>2-13 lb</td>
<td>1</td>
</tr>
<tr>
<td>14-23 lb</td>
<td>2</td>
</tr>
<tr>
<td>24-33 lb</td>
<td>3</td>
</tr>
<tr>
<td>34 lb or more</td>
<td>4</td>
</tr>
<tr>
<td>Unsure</td>
<td>2</td>
</tr>
</tbody>
</table>

**MST = 0 OR 1 NOT AT RISK**

- Eating well with little or no weight loss

**MST = 2 OR MORE AT RISK**

- Eating poorly and/or recent weight loss

**STEP 2: Score to determine risk**

- Weight loss score:
  - Add weight loss and appetite scores
  - MST SCORE:

**STEP 3: Intervene with nutritional support for your patients at risk of malnutrition.**

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**Scored Patient-Generated Subjective Global Assessment (PG-SGA)**

**History:** Boxes 1-4 are designed to be completed by the patient. (Boxes 1-4 are referred to as the PG-SGA Short Form [SF].)

**2. Food Intake:**

- As compared to my normal intake, I would rate my food intake during the past month as:
  - unchanged
  - more than usual
  - less than usual

- I am now taking:
  - normal food but less than normal amount
  - little solid food
  - only liquids
  - only nutritional supplements
  - very little of anything
  - very tube feedings or only nutrition by vein

**Box 1:**

- Max score = 5 points: up to 4 pts from wt loss + up to 1 pt for past 2 wks

**Box 2:**

- Score how the patient self-rates his/her intake during the past month: this helps to address recent deficit if current risk

**Box 3:**

- Any symptoms that patient reports include the below that has kept them from eating enough during the past 2 weeks.

**Notes:**

**Box 3 Any symptoms that patient reports include the below that has kept them from eating enough during the past 2 weeks.**

**Box 4:**

- Additive Score of the Boxes 1-4
Screening Results

Total Unique Patients All Centers = 381,369
Completed MST > 70%
Patient MST ≥ 2 = 8%
BPA Results

Best Practice Advisory Results, OSU RN Order Action by # of Patients

- Message RDN, No Order
- Referral to RDN Ordered
- Null, No Order
- Cancel BPA, No Order
- Talk to team, No Order
- Override the BPA, No Order
- Accept BPA, No Order
Head & Neck Poster Project – MST realization

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Percent Weight Change Over the Course of Treatment

<table>
<thead>
<tr>
<th>Patient</th>
<th>Tool</th>
<th>Week 1</th>
<th>Week 3</th>
<th>Week 5</th>
<th>Week 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MST</td>
<td>No</td>
<td>None</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>NFPE</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>MST</td>
<td>No</td>
<td>None</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>NFPE</td>
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<td>Yes</td>
<td>No</td>
<td>No</td>
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<tr>
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<td>MST</td>
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<td>Yes</td>
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<tr>
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<td>NFPE</td>
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<td>No</td>
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<td>No</td>
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Malnutrition Per MST and NFPE Scores Over Time

<table>
<thead>
<tr>
<th>Malnutrition Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>MST Score</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>NFPE Score</td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Mild</td>
</tr>
<tr>
<td>Moderate</td>
</tr>
<tr>
<td>Severe</td>
</tr>
</tbody>
</table>

Disagreement Between MST/NFPE

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kappa* 0.222** (fair agreement)
Connecting Inpatient & Ambulatory

- Embrace networking, team building
- Utilize in basket messaging
  - Ambulatory: tracking admissions
  - Inpatient: discharge planning messages
Questions?

15 mins